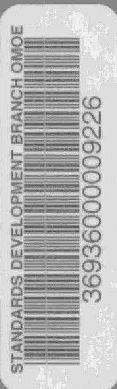


BEVU

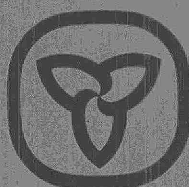


# GASOLINE CONTAMINATION OF A PRIVATE WELL

township of north colchester  
concession south of maldon road  
lot 18

j. p. phimister

1973



Ontario

Ministry  
of the  
Environment

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MINISTRY OF THE ENVIRONMENT

TOWNSHIP OF NORTH COLCHESTER

CONCESSION SOUTH OF MALDEN ROAD - LOT 18

GASOLINE CONTAMINATION OF A PRIVATE WELL

J. P. Phimister

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GASOLINE CONTAMINATION OF A PRIVATE WELL

INTRODUCTION

At the request of Mr. G. E. Crewe of the Ministry of Natural Resources, an investigation was undertaken by the Water Quantity Management Branch to determine the source of gasoline that was alleged to be present in domestic wells in and near Gesto in the Township of North Colchester. A field inspection of the area was made on May 16, 1973.

Background

On May 8, 1973, Mr. N. Mailloux, whose residence is about  $\frac{1}{2}$  mile west of the Community of Gesto, noticed gasoline odours emanating from his water distribution system when his jet pump broke suction. Shortly thereafter, Mr. Crewe was notified and the complaint was forwarded to this branch on May 14, 1973.

On May 14, 1973, Mr. J. A. Brown of the Ministry of Consumer and Commercial Relations obtained a sample of the liquid in Mr. Mailloux's well. The Ministry of the Environment's laboratory analysed the sample and found it to be pure, fresh gasoline.

On May 15, 1973, the gasoline tanks at the Supertest Station in Gesto were pressure tested. According to A. MacIver, Ministry of Consumer and Commercial Relations, a small leak was detected but a lack of gasoline in the soils and gasoline inventory records indicated that there had been no major gasoline losses.

#### FIELD INVESTIGATION

Figure 1 is a map showing the location of the residences and wells in the vicinity of Gesto and the N. Mailloux property. The locations of some of the gasoline tanks in the area are also shown.

On May 16, 1973, a survey of the residents in the area confirmed that the major gasoline problem was in Mr. N. Mailloux's well although it was reported that other residents, including Mrs. L. Rhodes, Mrs. L. Shepley and Mrs. L. Jones, thought that they had detected gasoline odours in their water. Mr. Albert Tessier, operator of the Supertest Station, had not noticed any taste or odour of gasoline in his well. Mrs. D. Gammon reported that her well was also free of gasoline tastes and odours.

A sample of water taken from an outside tap at the Rhodes residence did not have an odour of gasoline, but, hydrogen sulphide gas was present. Mr. L. Shepley reported that he had not smelled or tasted gasoline in his

water but his wife thought she had smelled gasoline. The Shepley water smelled only of hydrogen sulphide at the time of this investigation.

Mr. G. Mailloux whose residence is between N. Mailloux and the Community of Gesto reported that he had no problems with his well.

Mr. N. Mailloux's well was uncovered at the time of this investigation. He reported that prior to his gasoline problem there had been a plug in the top of the casing and a board platform over the well. The jet pump had been disconnected for safety purposes so that no samples could be obtained, but, an odour of gasoline was present in the top of the casing. No gasoline stains or grass kills were found on the ground anywhere around the well.

Apparently, the Mailloux well had been pumped on May 14th and most of the gasoline had been removed. At the time of this investigation, a wetted tape reading in the well indicated that there were only about 2 inches of gasoline on top of the water.

Most farms in the area have at least one gasoline storage tank. Mr. N. Mailloux has an above ground storage tank about 75 feet from his well. The present tank is owned by the Fina Petroleum Company and

was installed about one week prior to the gasoline contamination problem. Mr. Mailloux had used a tank supplied by the Old Castle Co-op before the Fina tank was installed. The Co-op had removed their tank at the end of March. Neither tank was reported as leaking and no gasoline stains were found on the ground around the tank location.

Mr. N. Mailloux was advised to pump the well to waste as soon as possible to remove the remaining gasoline and to prevent the spread of the gasoline contaminant in the aquifer.

#### HYDROGEOLOGY

Well records indicate that dolomite bedrock of the Detroit River Group of formations is overlain by 70 or more feet (21m) of overburden. The overburden comprises mainly flat-lying clayey till.

Wells in the area are all drilled and draw their water from either just above the bedrock or from within a few feet of the top of the rock. The land is so flat and the static water levels in the wells are so similar that it was not possible to establish a reliable ground-water gradient in the area.

#### DISCUSSION AND CONCLUSIONS

The chemical results for the sample obtained

from the N. Mailloux well on May 14, 1973, are shown in Table 1. Other wells in the area were not sampled as gasoline odours could not be detected in the well waters. Analytical techniques for measuring the presence of gasoline are far less sensitive than the sense of smell.

Laboratory analysis determined that the gasoline was fresh and had undergone little or no aging. Had the gasoline moved down through the overburden or migrated for some distance through the aquifer, some loss of the volatile components would have occurred and the laboratory would have detected aging. In addition, the volume of gasoline in the well was far greater than would be expected if a spill or leak had occurred at or near ground surface and then migrated through the ground to the well. There was no evidence that a spillage or leakage of gasoline had taken place near the well.

The thick, relatively impermeable overburden material gives excellent protection to the aquifer from surface contamination. The time required for a contaminant to move through the overburden would be quite long and extensive dilution and aging would occur during downward migration.

Based on the available data, it is concluded



that the gasoline found in the N. Mailloux's well must have been introduced directly into the well bore through the top of the casing.

#### RECOMMENDATIONS

In order to prevent the contamination of the aquifer from which all the area wells draw water, immediate steps should be taken to clean up the polluted well. A letter was sent to Mr. N. Mailloux on May 31, 1973, explaining the procedures to be followed in clean up operations.

These procedures included:

(a) pumping the well with a pump or bailer to remove the bulk of the gasoline.

(b) collecting the initial discharge in a drum and allowing the gasoline phase to separate.

(c) disposing of the gasoline in a remote area.

(d) flushing the well and pressure system with a detergent or caustic solution to remove traces of gasoline. This work should be carried out by qualified personnel.


(e) replacing any plastic components in the water distribution system, if necessary.

#### ALTERNATE SUPPLIES


If the gasoline taste and odour persists after reasonable efforts are made to remove the gasoline from

the well and aquifer by pumping, it may be possible to treat the supply with an activated carbon-diatomaceous earth filter. These devices are available commercially from firms specializing in water treatment problems. Alternately, a new well could be drilled in a more remote area or water could be hauled. There is no guarantee that a new well would remain free from gasoline if the contaminant has spread into the aquifer. Consequently, the need to pump the existing well is evident before attempting other alternatives.

Report by:

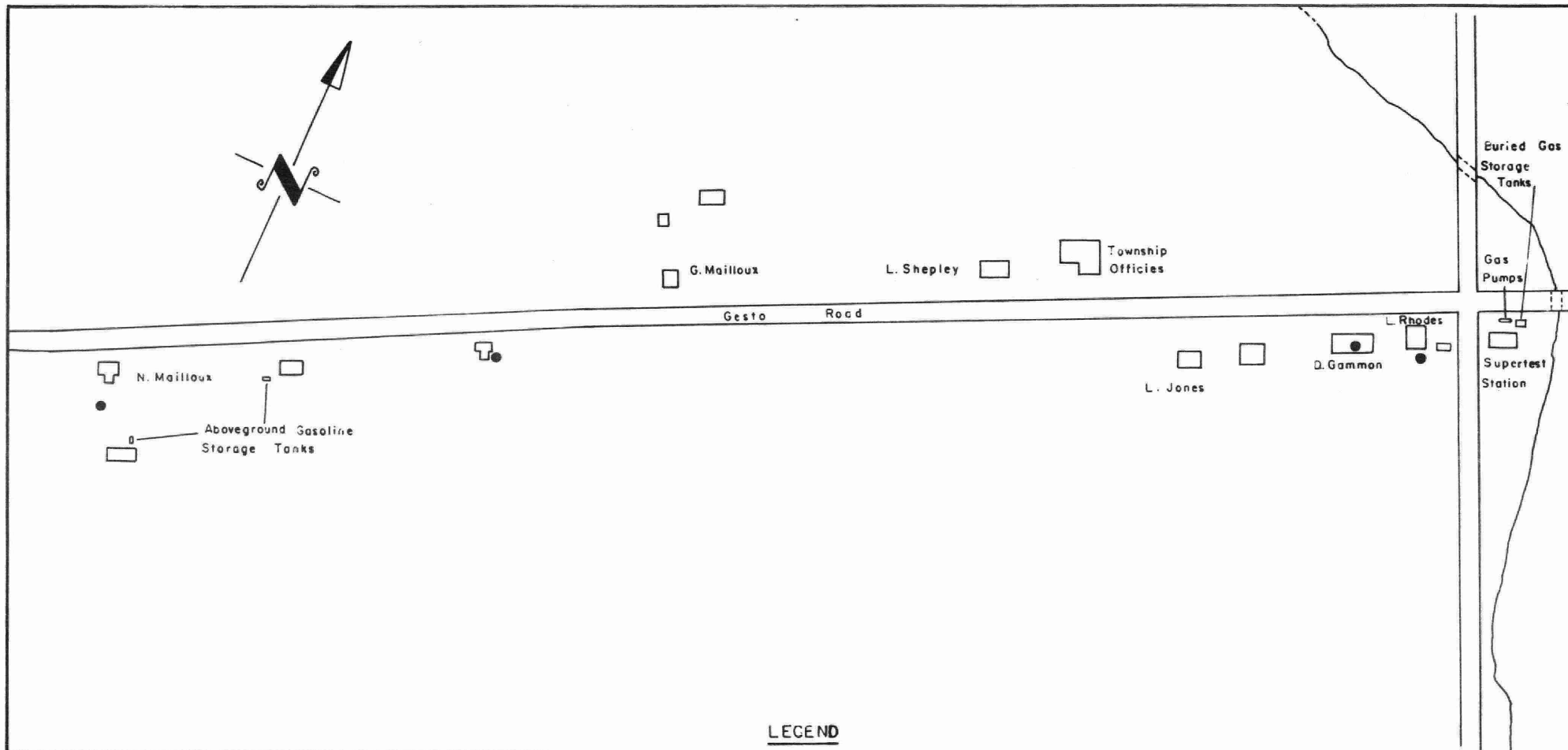
  
J. P. Phimister, Hydrogeologist,  
Surveys and Projects Section,  
Water Quantity Management Branch.

Approved by:

  
A. A. Sobanski, Program Engineer,  
Surveys and Projects Section,  
Water Quantity Management Branch.

JPP/af

12/6/73



**LEGEND**

● DRILLED WELL

**MINISTRY OF THE ENVIRONMENT**  
Water Quantity Management Branch

TOWNSHIP OF COLCHESTER NORTH  
COMMUNITY OF GESTO

**INVESTIGATION OF GASOLINE  
CONTAMINATION OF PRIVATE WELL**

Date: MAY '73

Prepared by: D S

Scale:  
1 IN. = 210 FT.  
(APPROX.)

Drawing No:  
FIGURE 1

MINISTRY OF THE ENVIRONMENT

CHEMICAL LABORATORIES

ORGANIC ANALYSIS

Table 1

All analyses except pH reported in  
mg/litre unless otherwise indicated

Municipality: North Colchester Twp.		Report to: A. Sobanski, WQMB		c.c. Central Files									
Source: Mailloux Well		A. MacIver, Energy Branch,		Organic Files									
Date Sampled: 14/5/73		by: J. Brown		Ministry of Consumer & Commercial Relations P. Diesay									
400 University Ave., Toronto		br											
Lab. No.	Gasoline												
0-361	*	<p>* Examination of the sample by infra red spectroscopy and gas chromatography confirmed that the sample consisted of pure gasoline.</p>											
0-361	<p>Sample taken from 90' well, Essex Co., Lot 19, on South Malden Road near village of Gesto.</p> <p style="text-align: right;">             WATER QUANTITY              MANAGEMENT BRANCH              MAY 23 1973              MINISTRY OF THE              ENVIRONMENT           </p>												